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VIA ELECTRONIC FILE DROP

Mr. Michael B. "Mick" Leat
Land Quality Bureau
Iowa Department of Natural Resources
Henry A. Wallace Building
502 East 9th Street
Des Moines, IA 50319-0034

RCRA



Subject: Leachate Control System Performance Evaluation Report – 2021
WDC Acquisition LLC Landfill
Creston, Iowa

Dear Mr. Leat:

Penn Environmental & Remediation, Inc. (Penn E&R) is pleased to submit this Leachate Control System (LCS) Performance Evaluation Report for calendar year 2021 for the landfill currently operated at the WDC Acquisition LLC (WDC) facility in Creston, Iowa. This performance evaluation is being submitted in fulfillment of the requirements specified in Section X.2.d of the Sanitary Disposal Project Permit No. 88-SDP-4-86P (Permit) issued September 15, 2021.

BACKGROUND

WDC currently operates a manufacturing facility located in Creston, Iowa, as shown in **Figure 1**. The plant produces aluminum and magnesium metal sand-mold casts of parts. The parts are then machined to specification. Industrial wastes such as reclaimed foundry sand, baghouse waste, and treated magnesium dross are generated and were previously disposed in the adjacent landfill, as shown in **Figure 2**.

As part of the operation of the landfill, a LCS consisting of collection trenches, a pump station, piping, and filtration system operates to control the groundwater level within the landfill. Piezometers within the boundaries of the landfill monitor the groundwater elevation. The actual treatment portion of the LCS consists of filtration, storage, sampling, and discharge, as shown in **Figure 3**. The LCS operates based on the level of leachate accumulated in the pump station draining the collection trenches. Leachate is transferred through a filter to the holding tank where it is periodically sampled and discharged.

ANALYTICAL RESULTS AND MAINTENANCE

Monthly performance results are recorded for operation of the LCS, including generated volumes and analytical data. A summary of the volumes collected through the LCS is presented in **Table 1**. For evaluation year 2021 (November 2020 through October 2021), approximately 2,734,100 gallons of leachate were collected, treated, and discharged to the City of Creston Publicly Owned Treatment Works (POTW). For 2021, the LCS was typically operated on a daily basis, with daily monitoring and monthly sampling.

The results from the monthly analytical sampling are presented in **Table 2**, along with the POTW discharge limits. No exceedances were identified in the 2021 evaluation year.

(It should be noted that WDC's leachate discharge is evaluated for compliance by the POTW using the mass loading for the volume of leachate discharged *the day* the monthly sample was taken. In this report, the concentrations of constituents in the monthly sample are used with the average and maximum daily leachate discharge volumes for *the month* to determine the mass loadings shown in **Table 2**.)

According to plant personnel, the LCS piping was last cleaned in December 2018. Iowa Administrative Code (IAC) 567.115.26(11)a(8) requires the LCS be cleaned at least once every three years.

COMPLIANCE WITH MAXIMUM LEACHATE HEAD

In Section X.2.d. of the Permit, two regulatory references are cited. First, IAC 567.115.26(11)a(1) is cited which requires that *"The leachate collection system shall be designed to allow not more than one foot of head above the top of landfill liner. The collection system must include a method for measuring the leachate in the landfill at the lowest areas(s) of the collection system."* Second, IAC 567.115.26(12)b(2) is cited which requires that *"Existing fill areas must address the design standards of subrule 115.26(11), except paragraph "a", subparagraphs (1) to (4). The leachate collection system must be designed to achieve the lowest possible leachate head above the landfill liner, and must include a method of measuring the leachate head."*

The locations of the piezometers used to monitor leachate elevations within the boundaries of the landfill are shown in **Figure 2**. **Table 3** summarizes the leachate elevation data for these piezometers. As recommended in the 2002 LCS Performance Evaluation Report, top of casing elevations of the subject piezometers were resurveyed in April 2003 by Mid-State Surveying & Consulting, Inc. of Creston, Iowa. This was done to confirm the elevations used in the past (Howard R. Green Company March 1999 Existing Topography) and to verify that past piezometer extensions have been accounted for. WDC continues to adjust top of casing elevations to account for casing reductions due to the ongoing net removal of waste material from the landfill and more recent surveys. The most current top of casing elevations are noted in **Table 3**.

Information obtained from the January 5, 1993 Hydrogeologic Investigation Report was used to more accurately reconstruct the base of landfill elevations at the piezometer locations. The results of this analysis indicate that the base of the landfill (based on the information available at the piezometer locations) lies at an elevation of approximately 1,255.50 feet above mean sea level, with a high at LPZ-21 of 1,258.34 feet and a low at LPZ-24 of 1,253.08 feet.

By using the current piezometer elevations to compute the elevation of the leachate within the landfill during 2021, it was found that leachate levels varied from a maximum of 5.99 feet above the landfill base (LPZ-26, November 2020) to a low of 5.12 feet above the landfill base (LPZ-23, April 2021).

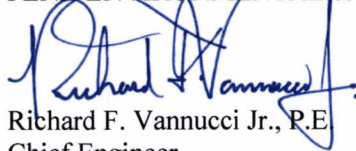
The evaluation of leachate elevations within the landfill demonstrates that more than 1 foot of head exists above the projected landfill base. However, as noted in IAC 567.115.26(12)b(2), the 1-foot requirement is intended for new landfills and is specifically exempted for existing fill areas. The leachate collection system in place at the landfill is intended to achieve the lowest possible leachate head above the landfill base by collecting leachate via the perimeter collection trenches. Continued tracking of leachate levels within the landfill, utilizing current top of piezometer elevations, will determine whether or not leachate levels are maintained at the lowest levels possible. Overall, the leachate levels within the landfill are

comparable to past levels. Refer to the Second Semiannual Landfill Inspection Report for 2021 for additional information regarding the performance of the LCS.

CONCLUSIONS

In accordance with Section X.2.d. of the Permit, effective control of leachate is defined as compliance with IAC 567.115.26(11)a(1) and IAC 567.115.26(12)b(2), and the maintenance of surface and groundwater quality standards at compliance monitoring points. As stated above, leachate levels within the landfill indicate that more than 1 foot of head exists above the projected landfill base. Continued evaluation of leachate levels within the landfill will determine whether leachate levels are maintained at the lowest possible levels; leachate elevations are comparable to past levels. The Annual Water Quality Report for 2021 Sampling Data details exceedances of groundwater quality standards for several parameters at several monitoring wells, consistent with data from previous annual reports.

Respectfully submitted,
PENN ENVIRONMENTAL & REMEDIATION, INC.



Richard F. Vannucci Jr., P.E.
Chief Engineer

RFV:cdb

Enclosures

cc: M. Thelen/WDC
P. Murrow/USEPA
C. Denton/B&T

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TABLES

Table 1
Monthly Performance Results
WDC Acquisition LLC Landfill
Creston, Iowa
Calendar Years 2020 - 2021

Sample Date	Average Daily Discharge in Gallons ⁽¹⁾	Max Daily Discharge in Gallons	Monthly Discharge in Gallons	Cumulative Discharge in Gallons
November 2020	8,368	23,100	234,300	234,300
December 2020	5,716	8,900	177,200	411,500
January 2021	5,726	9,900	154,600	566,100
February 2021	7,014	13,300	196,400	762,500
March 2021	8,781	14,100	228,300	990,800
April 2021	7,830	10,400	234,900	1,225,700
May 2021	8,555	18,200	265,200	1,490,900
June 2021	9,510	17,900	285,300	1,776,200
July 2021	10,355	19,000	321,000	2,097,200
August 2021	7,438	10,100	193,400	2,290,600
September 2021	8,170	14,900	245,100	2,535,700
October 2021	9,448	24,200	198,400	2,734,100

⁽¹⁾ Average calculated based on discharge days for the month, not calendar days.

Table 2
Discharge Limits and Analytical Sampling Results
WDC Acquisition LLC Landfill
Creston, Iowa
Calendar Years 2020 and 2021

Sample Date	Max. BOD (lbs/day) ⁽¹⁾	Max. Hexavalent Chromium (lbs/day) ⁽¹⁾	Max. Fluoride (lbs/day) ⁽¹⁾	Ave. Fluoride (lbs/day) ⁽²⁾	Max. Ammonia Nitrogen (lbs/day) ⁽¹⁾	Max. O&G (mg/l)	Max. Phenols (lbs/day) ⁽¹⁾	Max. TSS (lbs/day) ⁽¹⁾	Max. Chromium (lbs/day) ⁽¹⁾	Max. Lead (lbs/day) ⁽¹⁾	Ave. Lead (lbs/day) ⁽²⁾	Max. Zinc (lbs/day) ⁽¹⁾	Ave. Zinc (lbs/day) ⁽²⁾
November 2020	1.1566	0.0019	11.14	4.04	1.60	2.6500	0.0019	3.41	0.0010	0.0005	0.0002	0.0428	0.0155
December 2020	0.4456	0.0007	4.60	2.95	0.56	2.2500	0.0007	0.42	0.0006	0.0019	0.0012	0.1679	0.1078
January 2021	0.4957	0.0008	4.78	2.77	0.69	2.4500	0.0008	0.72	0.0002	0.0013	0.0008	0.0497	0.0288
February 2021	0.6659	0.0011	5.77	3.04	0.78	5.3000	0.0010	0.59	0.0003	0.0013	0.0007	0.0604	0.0318
March 2021	0.7060	0.0012	5.94	3.70	0.80	2.3500	0.0011	0.29	0.0003	0.0010	0.0006	0.0266	0.0166
April 2021	0.2604	0.0009	5.26	3.96	0.53	2.4000	0.0008	1.30	0.0002	0.0009	0.0007	0.0359	0.0271
May 2021	0.9113	0.0015	9.05	4.25	0.70	2.4000	0.0014	2.73	0.0004	0.0010	0.0005	0.0480	0.0226
June 2021	0.8963	0.0037	8.25	4.38	1.21	2.3500	0.0013	7.77	0.0004	0.0009	0.0005	0.1524	0.0809
July 2021	0.9513	0.0016	8.59	4.68	1.28	2.3500	0.0033	7.13	0.0004	0.0013	0.0007	0.2140	0.1167
August 2021	0.5057	0.0008	4.86	3.58	0.65	2.4000	0.0008	4.41	0.0002	0.0007	0.0005	0.0710	0.0523
September 2021	15.0452	0.0012	7.36	4.04	0.98	2.5500	0.0031	17.16	0.0017	0.00003	0.00002	0.0040	0.0022
October 2021	2.5042	0.0020	11.33	4.42	1.96	2.4000	0.0019	15.35	0.0041	0.0002	0.0001	0.0070	0.0028
Average Permitted Release (lbs/day)	25	0.05	40	40	1.5	50 (mg/L)	0.3	25	0.25	0.025	0.025	0.25	0.25
Maximum Permitted Release (lbs/day)	40	0.15	60	60	3	75 (mg/L)	0.3	40	0.75	0.075	0.075	0.75	0.75

Notes:

⁽¹⁾Table uses maximum discharge flow/day for the month in calculation of mass flow discharges unless otherwise noted.

⁽²⁾ Based on average discharge flow/day for the month (per discharge day not calendar day), unless otherwise noted.

⁽³⁾ Red shaded cells indicate exceedances based on POTW limits.

⁽⁴⁾ Blue shaded cells are calculated/reported using concentrations at one-half the reporting limit (ref: IDNR letter to Wellman dated May 9, 2013).

Table 3
Leachate Elevations
WDC Acquisition LLC Landfill
Creston, Iowa
Calendar Years 2020 and 2021

				November		December		January		February		March		April		May		June		July		August		September		October	
Well I.D.	TOC Elev. 11/2018 (ft MSL) ^(1,2)	TOC Elev. 01/2019 (ft MSL)	TOC Elev. 09/2019 (ft MSL)	Depth to GW (ft)	GW Elev (ft MSL)	Depth to GW (ft)	GW Elev (ft MSL)	Depth to GW (ft)	GW Elev (ft MSL)	Depth to GW (ft)	GW Elev (ft MSL)	Depth to GW (ft)	GW Elev (ft MSL)	Depth to GW (ft)	GW Elev (ft MSL)	Depth to GW (ft)	GW Elev (ft MSL)	Depth to GW (ft)	GW Elev (ft MSL)	Depth to GW (ft)	GW Elev (ft MSL)	Depth to GW (ft)	GW Elev (ft MSL)	Depth to GW (ft)	GW Elev (ft MSL)	Depth to GW (ft)	GW Elev (ft MSL)
LPZ-21 ⁽³⁾	NA ⁽⁴⁾	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LPZ-23	1281.24	1281.24	1277.24 ⁽⁵⁾	16.70	1260.54	16.71	1260.53	16.78	1260.46	16.83	1260.41	16.87	1260.37	16.91	1260.33	16.86	1260.38	16.71	1260.53	16.75	1260.49	16.76	1260.48	16.81	1260.43	16.85	1260.39
LPZ-24 ⁽³⁾	1273.87	1273.87	1273.87 ⁽⁵⁾	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LPZ-25 ⁽³⁾	1277.81	1277.81	1277.81	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LPZ-26	1281.33	1281.33	1277.83 ⁽⁵⁾	17.35	1260.48	17.42	1260.41	17.47	1260.36	17.5	1260.33	17.51	1260.32	17.58	1260.25	17.52	1260.31	17.50	1260.33	17.51	1260.32	17.53	1260.30	17.52	1260.31	17.55	1260.28

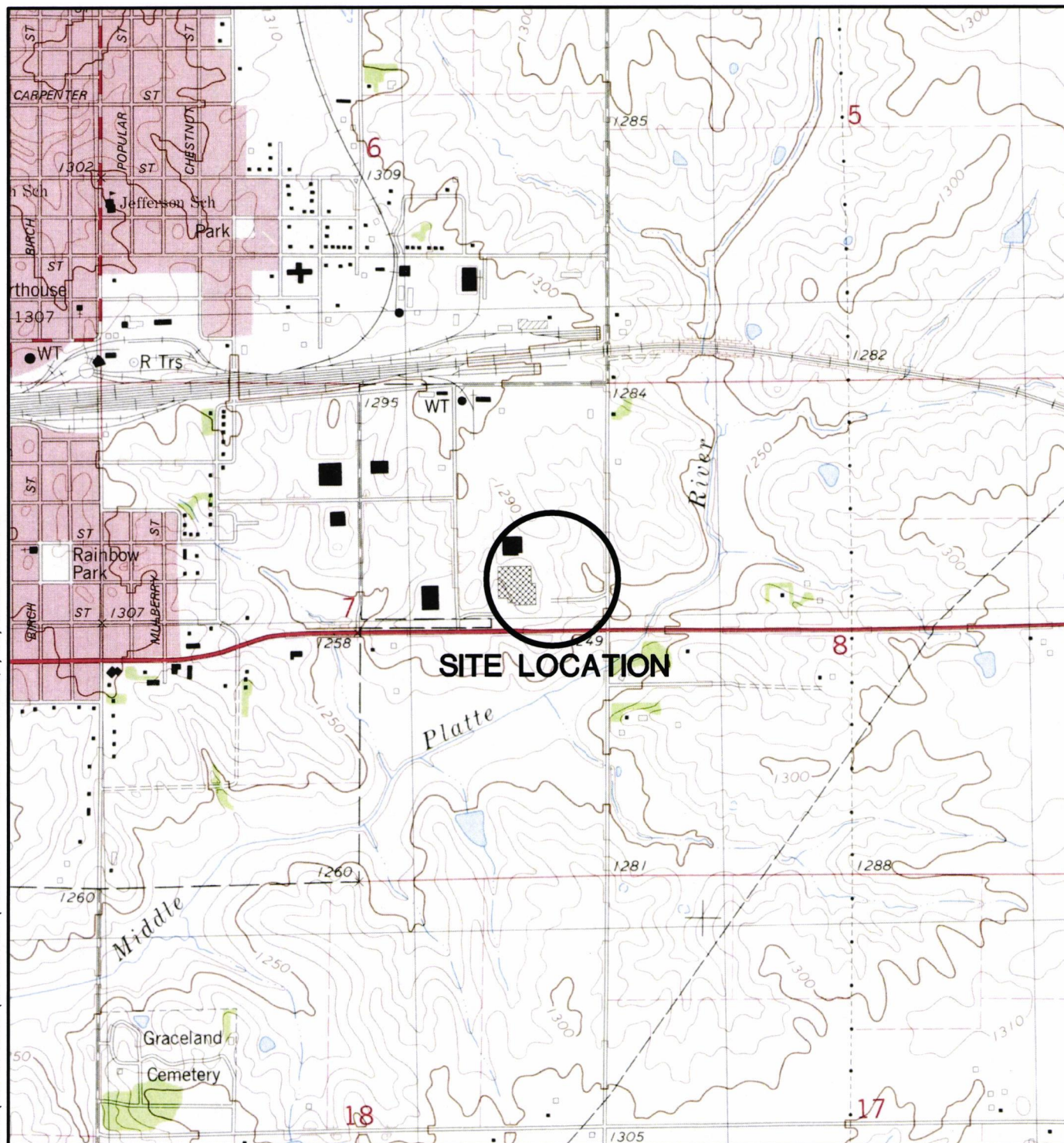
Notes:
(1) TOC = Top of inner casing.
(2) ft MSL = Feet above mean sea level.
(3) Damaged, not functional.
(4) NA = Not available.
(5) TOC elev. revised September 2019 due to resurvey.

Well I.D.	Orig. TOC 1993 HIR Report (ft MSL)	Well Depth to LF Base 1993 HIR Report (ft)	Elev LF Base 1993 HIR Report (ft MSL)
LPZ-21	1273.36	15.02	1258.34
LPZ-23	1272.96	17.75	1255.21
LPZ-24	1270.18	17.1	1253.08
LPZ-25	1274.49	18.6	1255.89
LPZ-26	1273.69	19.2	1254.49

		November		December		January		February		March		April		May		June		July		August		September		October	
Well I.D.	Elev LF Base 1993 HIR Report (ft MSL)	GW Elev (ft MSL)	Depth above LF Base (ft)	GW Elev (ft MSL)	Depth above LF Base (ft)	GW Elev (ft MSL)	Depth above LF Base (ft)	GW Elev (ft MSL)	Depth above LF Base (ft)	GW Elev (ft MSL)	Depth above LF Base (ft)	GW Elev (ft MSL)	Depth above LF Base (ft)	GW Elev (ft MSL)	Depth above LF Base (ft)	GW Elev (ft MSL)	Depth above LF Base (ft)	GW Elev (ft MSL)	Depth above LF Base (ft)	GW Elev (ft MSL)	Depth above LF Base (ft)	GW Elev (ft MSL)	Depth above LF Base (ft)	GW Elev (ft MSL)	Depth above LF Base (ft)
LPZ-21	1258.34	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LPZ-23	1255.21	1260.54	5.33	1260.53	5.32	1260.46	5.25	1260.41	5.20	1260.37	5.16	1260.33	5.12	1260.38	5.17	1260.53	5.32	1260.49	5.28	1260.48	5.27	1260.43	5.22	1260.39	5.18
LPZ-24	1253.08	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LPZ-25	1255.89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LPZ-26	1254.49	1260.48	5.99	1260.41	5.92	1260.36	5.87	1260.33	5.84	1260.32	5.83	1260.25	5.76	1260.31	5.82	1260.33	5.84	1260.32	5.83	1260.30	5.81	1260.31	5.82	1260.28	5.79

FIGURES

S:\PROJECT FILES\4000-PA008641 WDC 2021 OPS\LCPSE 2021\REFERENCE\FIGURE 1 - PA008641001.DWG, 1/26/2022 2:33 PM



SCALE - FEET
0 2000

REFERENCE
USGS 7.5-MIN TOPOGRAPHIC QUADRANGLE
CRESTON EAST, IOWA, DATED 1980 SCALE
1:24000.



FIGURE 1
SITE LOCATION MAP

WDC ACQUISITION LLC FACILITY
CRESTON, IOWA

PREPARED FOR
WDC ACQUISITION LLC
CRESTON, IOWA

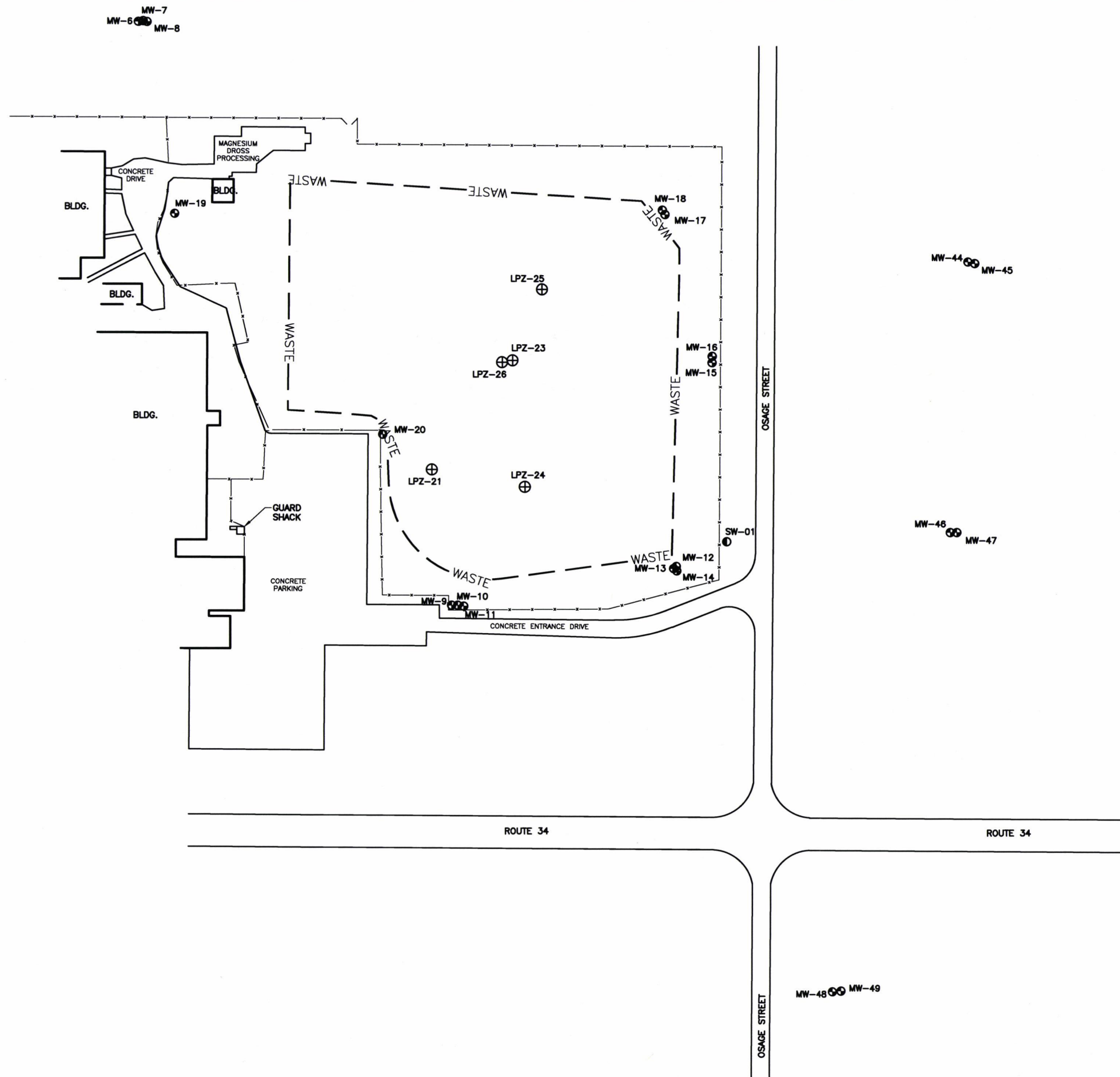
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PROJECT NO. 4000-PA008641

DRAWING NUMBER
PA008641001



Penn E&R
Environmental & Remediation, Inc.

S:\PROJECT FILES\4000-PA008641 WDC 2021 OPS\LCPSE 2021\REFERENCE\FIGURE 2 - PA008641201.DWG, 11/24/2021 8:35:21 AM



LEGEND

- SW-01 SURFACE WATER MONITORING POINT (APPROXIMATE LOCATION)
- MW-16 MONITORING WELL
- LPZ-21 LEACHATE PIEZOMETER
- WASTE APPROXIMATE LANDFILL BOUNDARY
- CHAIN LINK FENCE

REFERENCE:

1. TAKEN FROM GREEN ENVIRONMENTAL SERVICES, INC. "HYDROGEOLOGIC INVESTIGATION REPORT" JANUARY 25, 1993.
2. TOPOGRAPHIC AND ELEVATION SURVEY BY GARDEN & ASSOCIATES, LTD., JUNE 13, 2018.



SCALE - FEET



REVISION	DATE	DESCRIPTION

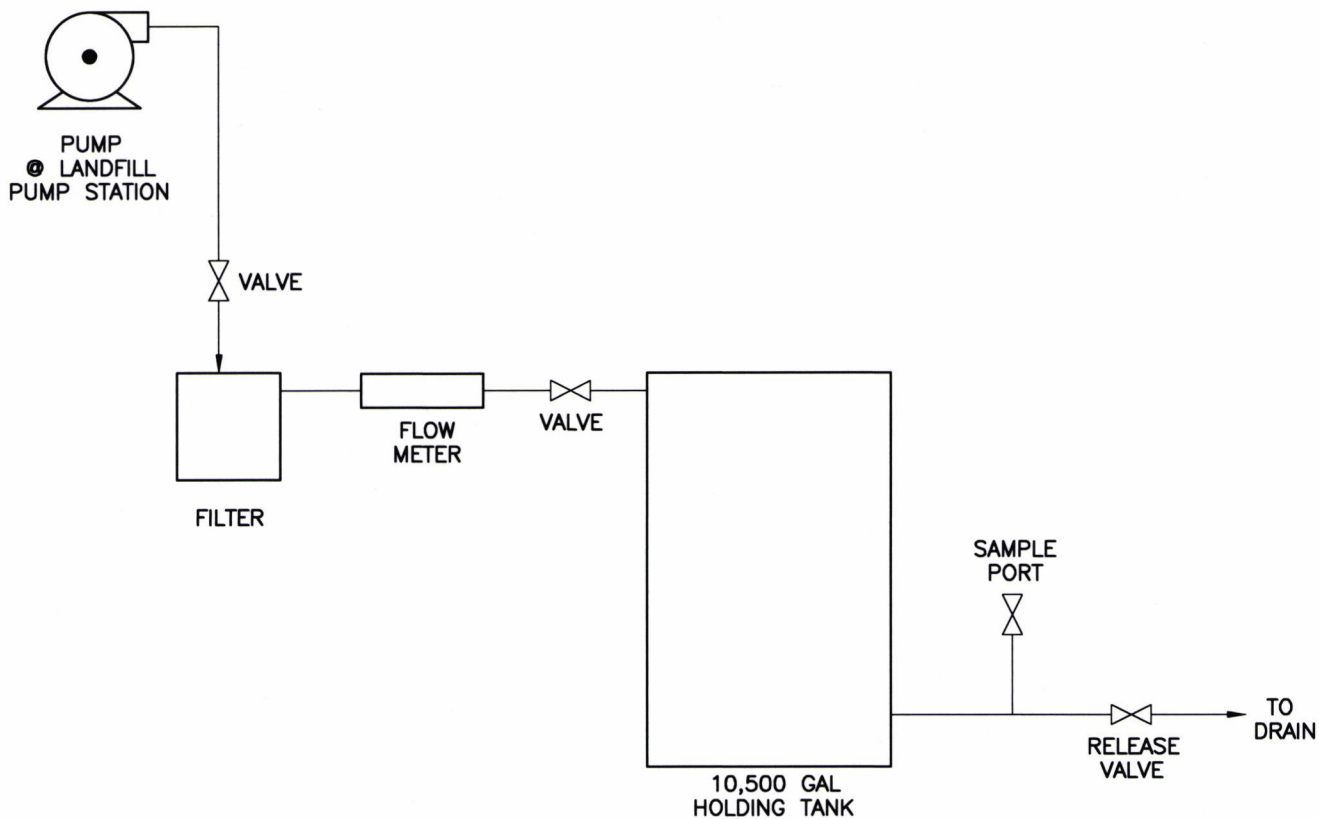
FIGURE 2 SITE PLAN

WDC ACQUISITION LLC FACILITY
CRESTON, IOWA

PREPARED FOR
WDC ACQUISITION LLC
CRESTON, IOWA

APPROVED	RFV 01/26/2022
CHECKED	RFV 01/26/2022
DRAWN	CAC 11/24/2021
PROJECT NO.	4000-PA008641
DRAWING NUMBER	PA008641201





DRAWING NOT TO SCALE

FIGURE 3
LEACHATE CONTROL SYSTEM
TREATMENT FACILITY
WDC ACQUISITION LLC
CRESTON, IOWA

PREPARED FOR
WDC ACQUISITION LLC
CRESTON, IOWA

APPROVED RFV 01/26/2022

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